

JAPAN

EDICT OF GOVERNMENT

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JIS B 6596 (1991) (English): Double sizers --
Test and inspection methods

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

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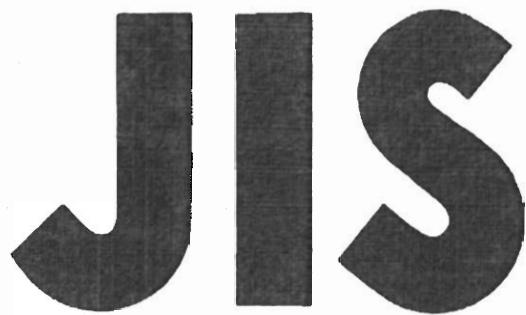


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JAPANESE INDUSTRIAL STANDARD

**Double sizers —
Test and inspection methods**

JIS B 6596-1991

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

1. Scope

This Japanese Industrial Standard specifies the test methods relating to the functions, running performances and rigidities and inspection methods on static accuracies and machining accuracies of the double sizers of 950 mm or over to 3350 mm or under in the maximum interval of circular saws.

Remarks 1. The double sizer means the machine which cuts ply woods and the like, feeding these automatically, into the prescribed dimensions mainly by two of circular saws.

In many cases, two sets are combined to cut into the prescribed longitudinal and lateral dimensions (See JIS B 0114).

2. The applicable standards to this Standard are as given in the following:

JIS B 0114-Glossary of terms for wood working machinery

JIS B 6507-General code of safety for wood working machinery

JIS B 6521-Methods of measurement for noise emitted by wood working machinery

3. The units and numerical values given in { } in this Standard are based on the traditional units and are appended for informative reference.

2. Functional test methods

The functional tests of the double size shall be in accordance with Table 1.

Table 1. Functional tests

No.	Test item	Test method
1	Electric equipment	Before and after running the test, examine insulating conditions once each.
2	Start, stop and running operation of left and right main spindles	At an appropriate rotational speed of main spindle, carry out 10 times of start and stop repeatedly to examine the smoothness and reliability of actions.
3	Changing operation of rotational speeds of left and right main spindles	Change the rotational speeds of main spindle on overall speeds of rotation of the marking to examine the smoothness of the actions and the reliability of the indications of the operating device.

Table 1. (Continued)

No.	Test item	Test method
4	Start, stop and running operation of feed device	At an appropriate feed speed, carry out 10 times of start and stop repeatedly to examine the smoothness and reliability of actions.
5	Changing operation of feed speeds	Change the feed speeds on overall marked speeds, and, for that of variable speed type, on the three speeds of the minimum, intermediate and maximum, to examine the smoothness of actions and the reliability of indications of the operating device.
6	Operations of ascending and descending and clamping of main spindle and operation of automatic stop	Allow the main spindle to ascend and descend and examine the smoothness and uniformity of actions throughout the overall length of the motion, and examine, at the center and both ends of the motion, the reliability of clamping and the smoothness of the actions of the clamping device. In addition, at both ends of the motion, examine the smoothness and reliability of the actions of the automatic stopping device.
7	Attaching and detaching of circular saw	Examine the smoothness and reliability of the attaching and detaching of circular saw and clamping of the clamping screw.
8	Adjusting device of circular saw interval	Allow the travelling table of main spindle device to travel to examine its smoothness and reliability.
9	Pressurizing device	Examine the smoothness and reliability of function.
10	Safety device	Examine the safety function for workers and the reliability of the protective function for machine (See JIS B 6507).
11	Lubrication device	Examine the reliability of such functions as the oil-tightness and proper distribution of oil quantity.
12	Pneumatic device	Examine the reliability of such functions as the air-tightness and pressure regulation.
13	Accessories	Examine the reliability of functions.

Remarks: For the double sizer which is not provided with the said functions, test items corresponding to these in Table 1 shall be omitted.

3. Running test methods

3.1 No-load running test Allow the left and right spindles to rotate, continue running for 30 to 60 minutes, measure the required electric power and noise after bearing temperatures have been stabilized, record on each item specified in the Record Format 1 of Table 2, and, at the same time, observe that no abnormal vibration takes place by the sense of touch.

Furthermore, the measurement of the noise shall be in accordance with JIS B 6521.

Table 2. Recording format 1

No.	Time of measurement o'clock·minute		Rotational speed of spindle r/min {rpm}	Feed speed m/min	Bearing temperatures °C				Required electric power			Room temperature °C	Description	
	Marked	Actually measured			Left	Right spindle	Left	Left spindle	Right	V	A	kW		

Remarks 1. That is provided with the variable speed device of rotational speeds of left and right spindles, record shall be made on the rotational speeds of at least two conditions including the maximum rotational speed.

2. The measuring conditions of the noise shall be recorded in the description column.

3.2 Load running test Saw a test specimen, measure the required electric power and noise, record on each item specified in the Record Format 2 of Table 3, and at the same time, observe that no abnormal vibration takes place and the conditions of sawn section by the sense of touch.

The measurement of the required electric power shall be carried out by changing the thicknesses of test specimen at a definite feed speed or changing the feed speeds at a definite thickness of the test specimen.

Furthermore, the measurement of the noise shall be in accordance with JIS B 6521.

Table 3. Recording format 2

No.	Test specimen			Tool	Sawing conditions	Required electric power			
	Dimension		Species of tree or type of wood						
	Length mm	Width mm							
			Thickness mm						
				Moisture content %	%				
				Humidity %	%				
				Diameter mm					
				Thickness mm					
				Set width mm					
				No. of teeth					
				Tooth shape					
				Material of cutting edge					
				Rotational speed of spindle r/min (rpm)					
				Cutting speed m/min					
				Feed speed m/min					
				Projection of saw body mm					
				Voltage V					
				Current A					
				No-load P_0 kW	Inputs				
				Load F kW					
				Cutting power $P_i - P_0$ kW					
				Noise dB (A)					
				Description					

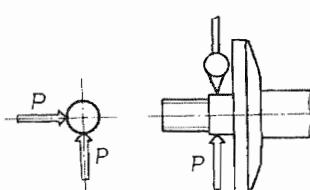
Remarks 1. The cutting direction of test specimen, saw-way width and measuring conditions of noise shall be recorded in the description column.

2. As regards the tooth shape, main dimensions shall be filled in an illustration.

4. Rigidity test method

The rigidity test of the double sizer shall be in accordance with Table 4.

Table 4. Rigidity test

No.	Test item	Measuring method	Diagram for measuring method
1	Bending rigidity of main spindle system ⁽¹⁾	<p>Apply a fixed indicator to the extreme end part (side face) of the spindle, apply the load (P) in the vertical direction of the spindle⁽²⁾, and measure the deflection of the main spindle.</p> <p>In this measurement, carry out applying the load in two directions vertical to each other.</p>	

Note ⁽¹⁾ This measurement shall be carried out on the left and right spindles.

⁽²⁾ The position to which the load is applied should be the nearer position to the spindle end as far as possible, and the distance from the fixed end of the spindle shall be recorded.

Remarks

1. The rigidity test of the machines of the same design shall be represented by the results of the test which has been carried out on a representative set, and the tests on others may also be omitted.
2. The magnitude of the load (P) shall be the recommended value by the manufacturer, and its value shall be recorded.
3. This measurement shall be carried out after the bearing temperatures have been stabilized, rotating the spindle.

5. Static accuracy inspection method

The static accuracy inspection of the chain caterpillar feeding system double sizer shall be in accordance with Table 5.

Table 5. Static accuracy inspections

No.	Inspection item	Measuring method	Diagram for measuring method	Unit: mm
				Permissible value
1	Runout of main spindle ⁽¹⁾	Apply a fixed test indicator to the outer peripheral face of the circular saw mounting part, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.02
2	Movement of main spindle in axial direction ⁽¹⁾	Apply a fixed test indicator to the tip end of the main spindle, shake the main spindle in axial direction ⁽³⁾ , and consider the maximum difference of the readings of the test indicator to be the measured value.		0.02
3	Runout of flange face ⁽¹⁾	Apply a fixed test indicator to the flange face, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.03 per 100 of diameter

Table 5. (Continued)

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
4	Straightness of reciprocating movement of travelling table of spindle device	In horizontal plane	Place a straight-edge in parallel to the travelling direction of the travelling table of main spindle device (hereafter referred to as the "travelling table".)(⁴), apply the test indicator fixed to the travelling table to this and allow it to travel, and consider the maximum difference of the readings of the test indicator within the total travelled distance of the travelling table to be the measured value(⁵).	0.05 per 1000
		In vertical plane		0.05 per 1000
5	Straightness of sliding face of bed(⁶)	Place a precision level on the sliding face of the bed(⁷), take readings of the precision level at three or more places of the center and both ends, and consider the maximum difference thereof to be the measured value.		0.05/m

Table 5. (Continued)

Unit: mm

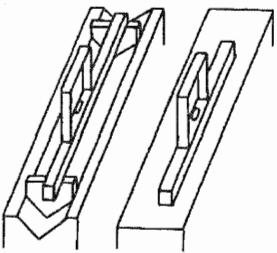
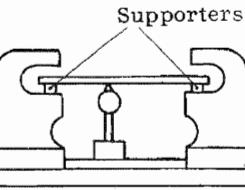
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
6	Parallelism of sliding faces of front and rear beds	Place straight-edges on the sliding faces of the front and rear beds ⁽⁷⁾ , place precision levels on them, take readings of respective precision levels, and consider the difference thereof to be the measured value.		0.05/m
7	Parallelism of sliding face of bed to upper faces of left and right chain guides ⁽⁶⁾	Allow a straight-edge ⁽⁸⁾ to straddle over upper faces of left and right chain guides using two supporters equal in thickness, apply a test indicator placed on the sliding face of bed or the straightedge placed on the sliding face of bed to the straightedge on the left and right chain guides, and consider the maximum difference of the readings of the test indicator at both ends to be the measured value.		0.10

Table 5. (Continued)

Unit: mm

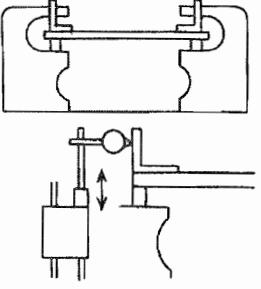
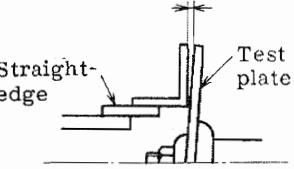
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
8	Perpendicularity of up and downward motion of main spindle to upper face of chain guide ⁽¹⁾	<p>Allow a straight-edge⁽⁸⁾ to straddle over upper faces of left and right chain guides using two supporters equal in thickness, fix a square to it, apply the test indicator attached to the main spindle table to this, allow the main spindle table to travel in an up and downwards motion, and consider the maximum difference of the readings of the test indicator to be the measured value.</p> <p>Carry out this measurement, taking the interval of the travelling tables as the largest and the smallest.</p>		0.05 per 100
9	Perpendicularity of saw body face and upper face of chain guide ⁽¹⁾	<p>Mount a test plate⁽⁹⁾ to the main spindle, place a straightedge on the upper face of chain guide, stand a square on it, apply this to the test plate face, measure clearance by a feeler gauge, and consider the maximum value to be the measured value. Carry out this measurement, taking the interval of the travelling tables as the largest and the smallest⁽¹⁰⁾.</p>		0.04 per 100

Table 5. (Continued)

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
10	Perpendicularity of chain groove ⁽¹¹⁾	Left vertical face	Place a straight-edge in parallel to the chain groove ⁽¹²⁾ , apply the test indicator attached to a block to the side face of the chain groove, and, at the same time, allow its tip end to travel applying to the straightedge, and consider the maximum difference of the readings of the test indicator in the total travelled distance to be the measured value.	0.06 per 1000
		Right vertical face		0.06 per 1000
11	Parallelism of left chain groove in respect to right chain groove		Apply the test indicator attached to a block to the side face of the chain groove and, at the same time, apply its tip end to the side face of another chain groove, or by an internal micrometer, measure at least three places of center and both ends, and consider the maximum difference of the readings thereof to be the measured value.	0.12 per 1000

Notes ⁽³⁾ The force to shake in axial direction shall be about 150 N{15 kgf}.

⁽⁴⁾ The straightedge shall be adjusted so that the readings of the test indicator coincide at the both ends of the travelling range of the travelling table.

Notes (5) In the case where the straightedge is shorter than the travelling distance of the travelling table, allow the straightedge to travel in turns to measure on the total travelled distance of the travelling table.

(6) Carry out this measurement on the sliding faces of the front and rear beds.

(7) In the case where the sliding face of bed is of V shaped groove, measure by placing the straightedge on the blocks of the same dimensions, conforming to the V-shape..

(8) Set the straightedge taking approximately on the center line of the left and right main spindles as reference.

(9) The size of the test plate shall be of the size which is not impedimental in inspection, and the permissible value of its straightness shall be as $(0.007 + \frac{L}{100000})$ mm. Where L indicates the diameter (mm) of the test plate.

(10) In this measurement, carry out measurement taking the center of the runout of the test plate which has been attached to the flange face as reference.

(11) Carry out this measurement on the left and right chain grooves, and at the same time, carry out by travelling the interval between the left and right chain grooves.

(12) The straightedge shall be adjusted so that the readings of the test indicator coincide at both ends of the travelling distance of the chain groove.

Remarks: For the double sizer which is not provided with the said function, the equivalent inspection item to this in Table 5 shall be omitted.

5.2 The static accuracy inspection of roll-feed system double sizer shall be in accordance with Table 6.

Table 6. Static accuracy inspection

Unit: mm

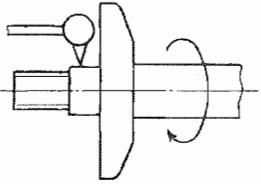
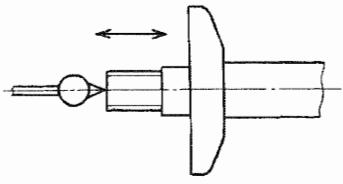
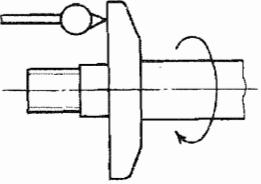
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
1	Runout of main spindle	Apply a fixed test indicator to the outer peripheral face of the circular saw mounting part, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value.		0.02
2	Movement of main spindle in axial direction ⁽¹⁾	Apply a fixed test indicator to the tip end of the main spindle, shake ⁽³⁾ the main spindle in axial direction, and consider the maximum difference of the readings of the test indicator to be the measured value.		0.02
3	Runout of	Apply a fixed test indicator to the flange face, rotate the main spindle manually, and consider the maximum difference of the readings of the test indicator to be the measured value.		0.03 per 100 of diameter

Table 6. (Continued)

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
4	Straightness of reciprocating motion of travelling table of main spindle device	In horizontal plane	Place a straight-edge in parallel to the travelling direction of the travelling table of main spindle device (hereafter referred to as the travelling table.) ⁽⁴⁾ , apply the test indicator fixed to the travelling table to this and allow to travel, and consider the maximum difference of the readings of the test indicator within the total travelled distance of the travelling table to be the measured value ⁽⁵⁾ .	0.05 per 1000
		In vertical plane		0.05 per 1000
5	Reciprocal difference of diameters of feed rolls	Measure the centers of the feed rolls with an external micrometer, and consider the maximum value of the differences of respective feed rolls to be the measured value.		0.10

Table 6. (Continued)

Unit: mm

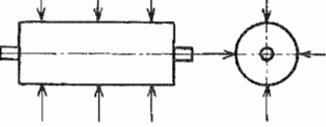
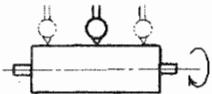
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
6	Cylindricity of feed roller	Among the maximum differences of diameters of the feed roll which have been measured respectively in two planes vertical to each other, including the axis, consider the larger value to be the measured value. The measuring places shall be at least three places of the center and both ends(^{1/3}) of the feed roll.		0.03 for feed rolls of 1500 or under in length 0.05 for feed rolls of 1500 or over in length
7	Runout of feed roll	Apply a test indicator to the outer peripheral face of the feed roll, rotate the feed roll manually, and consider the maximum difference of the readings of the test indicator during rotation to be the measured value. Carry out this measurement at three places of the center and both ends(^{1/3}) of the feed roller.		0.03 for feed rolls of 1500 or under in length 0.05 for feed rolls of 1500 or over in length

Table 6. (Continued)

Unit: mm

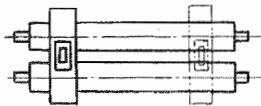
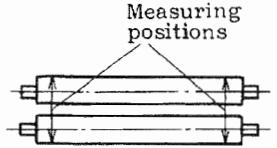
No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
8	Parallelism of lower feed rolls	In horizontal direction Place a precision level on the straightedge which has been straddled over the lower feed rolls, and take the difference of the readings of the precision level at both ends of the lower feed rolls. Carry out this measurement on respectively adjacent lower rolls, and consider the maximum difference thereof to be the measured value(¹⁴).		0.30/m
	Between rolls	Measure the intervals at both ends of respectively adjacent lower rollers with a vernier calipers, and consider the difference of the respective readings to be the measured value (¹⁴).		0.20

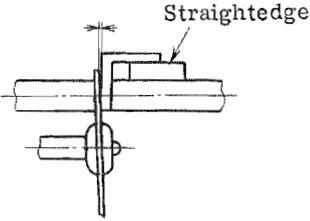
Table 6. (Continued)

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
9	Parallelism of upper feed roll to lower feed roll	Adjust the interval between the upper roll and the lower roll to zero, place a straightedge in vertical direction to the upper and lower rolls, apply a precision square level to it, take the readings of the precision level at the both ends of feed rolls, and consider the difference thereof to be the measured value(¹⁴).		0.30/m
10	Perpendicularity of up and down motion of main spindle and upper face of lower feed roll(¹)	Fix a square on the straightedge which has been straddled over the lower feed rolls, apply the test indicator which has been attached to the main spindle table to this, allow the main spindle table to this, allow the main spindle table to travel up and down, and consider the maximum difference of the readings of the test indicator to be the measured value. Carry out this measurement, adjusting the intervals of the travelling table to the maximum and the minimum.		0.05 per 100

Table 6. (Continued)

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
11	Perpendicularity of saw body face and upper face of lower feed roll (1)	Mount a test plate (3) to the main spindle, fix a square on the straightedge which has been straddled over the lower feed rolls, apply it to the test plate, measure clearances with a feeler gauge, and consider the maximum value thereof to be the measured value. Carry out this measurement adjusting the interval of the travelling table to the maximum and the minimum.		0.04 per 100

Notes (1³) Carry out measurement avoiding the part of shear drop.

(1⁴) Carry out this measurement, taking the smallest position of the runout of the lower feed roll as reference.

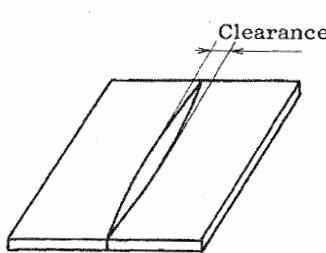
Remarks: For the double sizer which is not provided with the said function, the inspection item corresponding to this in Table 6 shall be omitted.

6. Machining accuracy inspection method

The machining accuracy inspection of the double sizer shall be in accordance with the following:

Table 7. Machining accuracy inspection

Unit: mm

No.	Inspection item	Measuring method	Diagram for measuring method	Permissible value
1	Straightness of sawn face	Saw off two test specimens, place these face to face so that the sawn sections of the same side of two test specimens confront each other, measure clearances with a feeler gauge over its total length, and consider 1/2 the maximum value thereof to be the measured value.		0.25 per 1000

Remarks: The test specimen shall be subjected to the necessary pre-processes in advance.

Reference Standards:

JIS B 6501-Test Code for Performance and Accuracy of Wood Working Machinery

JIS Z 8203- SI Units and the Use of Their Multiples and of Certain Other Units